This assignment gives us chances to study how to use Excel and R language to analyze data through linear regression and univariate analysis. And the data we use is downloaded from Yahoo finance.

**Part 1: Basic Statistics**

In both R and Excel, we calculated the following variables of the stock price of JP Morgan in the year of 2018 in a daily basis.

|  |  |
| --- | --- |
| Average Stock Value | 105.6712 |
| Stock Return Volatility | 1.44% |
| Daily Stock return | See the graph below |

アンテナ が含まれている画像

自動的に生成された説明

From the above Graph we see that in the year 2018, JP Morgan’s stock price is very volatile since daily changed went to 5% often, this indicates that the stock is somewhat a risky asset to consider.

In the following we show the JP Morgan stock price evolution using a scatter plot. It is drew in the Excel.

**Part 2: Linear Regression**

Linear regression is a method to study correlation between two or more random variables. In this context, we study the correlation between S&P 500 index and JP Morgan stock price in the year 2018 in a daily basis.

Let’s have a look at the data plot first

Through LINEST function in excel we also calculated the slope and interception as follows, which are consistent with the number shown in the figure above.

|  |  |
| --- | --- |
| slope | interception |
| 0.033579097 | 13.5549205 |

We calculated the correlation of the S&P 500 and JP Morgan stock price as

0.80689490068921, which is very close to 1. So we see they are stronghly correlated but we need to a statistic test to the is the correlation is trusty.

We then did a test of the linear regression model which are summarized as follows:

スクリーンショットの画面

自動的に生成された説明

We see from the p value for slope and interception in the data above to conclude that the correlation is authentic, which is obviously understandable, in general S&P 500 index and the individual stock are always very correlated.

**Part 3: Univariate Time Series**